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The PSYCHOLOGICAL RECORD

JULY,
Vol. III

1939
No. II

RELATION BETWEEN ACHIEVEMENT OF MEDICAL
STUDENTS IN PRECLINICAL MEDICINE AND
ACHIEVEMENT IN CLINICAL MEDICINE

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THE PRINCIPIA PRESS, INC.
BLOOMINGTON, INDIANA

Price of this number, 15 cents

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RELATION BETWEEN ACHIEVEMENT OF MEDICAL STUDENTS IN PRECLINICAL MEDICINE AND ACHIEVEMENT IN CLINICAL MEDICINE*†

BY CHARLES H. BROWN, *Rush Medical College***
and
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There is a scarcity of data on the relation between the study of specific course material during the first two years of medical training and the more practical training in clinics and with patients during the last two years. Moon¹ has obtained Pearson product-moment coefficients of correlation of .67 and .74 between second- and third-year grades of two classes at the University of Illinois. He says: "The fact that the correlation between the second and third year is approximately the same as that between the first and second year is surprising. It appears from this that there is no more of a break in students' records at the end of the preclinical years than between the first and second year." The size of Moon's coefficients is somewhat surprising in view of factors such as subjects of study, personality, and ability to get along with patients and internes, which operate in clinical but not in preclinical medicine. We have found a relationship between achievement in preclinical medicine and achievement in clinical medicine comparable to that found by Moon between the second and third years. The average preclinical grades, in terms of grade points obtained by 399 students at the University of Chicago, have been correlated against the average clinical grades obtained by the students in two years of clinical medicine at Rush Medical College. We have also determined the coefficient of correlation between the average grade in clinical medicine and the grade received in each of the five main departments of preclinical medicine: anatomy, bacteriology, biochemistry, pathology, and physiology.

* We are grateful to Dean Emmett C. Bay of Rush Medical College for his cooperation and advice in this study.

† Recommended for publication by Dr. J. R. Kantor, June 8, 1939.

** Now at Henry Ford Hospital, Detroit, Michigan.

¹ Moon, G. R. Study of premedical and medical scholastic records of students in the University of Illinois College of Medicine. *J. Ass. Amer. Med. Coll.*, 1938, 13, 208-212.

A second problem in the achievement of students in clinical medicine at Rush Medical College involves a comparison of grades obtained by students transferring from two- and four-year medical schools. Rush Medical College is somewhat unusual in that it admits to clinical medicine a fairly large number of transfer students from schools offering only preclinical medicine. We have found that these transfer students make a significantly worse record, in general, at Rush Medical College than students spending their entire four years at the University of Chicago or transferring from four-year schools.

TABLE 1
COEFFICIENTS OF CORRELATION BETWEEN PRE-
CLINICAL GRADES AND AVERAGE CLINICAL GRADES

	r	N	PE
Preclinical average .....	.61	399	$\pm .02$
Pathology .....	.61	150	$\pm .04$
Physiology .....	.56	150	$\pm .04$
Bacteriology .....	.55	148	$\pm .04$
Anatomy .....	.47	151	$\pm .04$
Biochemistry .....	.46	148	$\pm .04$

Pearson product-moment coefficients of correlation between the average clinical grade and the preclinical average and departmental grades are given in Table 1 with the number of students and probable error for each coefficient. The coefficient of correlation between preclinical and clinical averages ($.61 \pm .02$) is approximately of the same order of magnitude as that obtained by Moon between second- and third-year grades and indicates a real relationship between preclinical and clinical achievement. Apparently the factors which make an individual a good student during his first two years also operate during his last two years. The relationship between grade in a specific department of preclinical medicine and average clinical grade is greatest for pathology, least for anatomy and biochemistry.

The average grades of 1,025 students entering clinical medicine at Rush Medical College from various schools in the country are listed in Table 2 according to school. Only grades obtained at Rush

TABLE 2
COMPARISON OF GRADES OF TRANSFER STUDENTS AND
NON-TRANSFER STUDENTS AT RUSH MEDICAL COLLEGE

School	Number of years of medi- cine	N	Mean grade	PE _m	CR _{PE} of difference between mean for each school and mean for school "L"	Percentage of students whose grades were equal to, or greater than, 4.15
A	2 and 4	127	3.69	± .035	10.22	20
B	2	68	3.78	± .072	4.82	25
C	2	102	3.84	± .044	5.97	22
D	2	85	3.88	± .046	5.09	29
E	2	36	3.92	± .081	2.67	36
F	2	79	3.93	± .063	3.19	38
G	2	10	4.03	± .170	.22	30
H	2	17	4.04	± .111	.96	29
I	4	12	4.05	± .127	.77	42
J	2	49	4.06	± .107	.99	52
K	4	35	4.08	± .093	.72	48
L	4	405	4.15	± .029	.00	50

in the two clinical years and expressed in terms of grade points are considered here. The lower the number of grade points, the poorer is a student's grade. Six grade points represent the highest obtainable average. Schools at which students received their preclinical training are indicated in the first column by letters of the alphabet. Column 2 lists the number of years of medicine each school teaches; column 3 the number of students entering clinical medicine at Rush from each school; and column 4 the mean grade obtained by students from each school at Rush.

The poorest average grade (3.69) was obtained by 127 students from school "A." Many students enter and complete the first two years of medicine at "A" who cannot be kept for the clinical years.

In this respect "A" is both a two- and four-year school. In order to complete their medical training a large number of students must transfer from "A" to some other school for the last two years. The inferior record of students from "A" may very well result from transfer of the poorer students rather than from inadequate medical training.

Students from 7 of the remaining 8 two-year schools obtained lower average grades than students from 3 four-year schools. Column 6 of Table 2 lists the critical ratio_{PE} of the difference between the mean grade for students transferring to Rush from each school and the mean grade obtained by students continuing from the University of Chicago, School "L." Of the 9 two-year schools, including "A," the difference is certain beyond reasonable doubt for 4 and fairly certain for 2. No significant difference is present between the average grades of students from 3 two-year schools and 2 four-year schools and the average grade of students continuing at Rush from "L." The last column of Table 2 gives the percentage of students from the various schools who obtained an average of 4.15 or better at Rush in clinical medicine. The average grade at Rush of students from "L" is 4.15 grade points. We note that all schools, except "J," with a percentage below 40, are two-year schools; while 3 of the 4 schools, at least 40 per cent of whose students attained an average of 4.15 or more, are schools with four years of medicine.

Table 2 clearly indicates the scholastic inferiority, in general, at Rush of students who transfer there from schools offering only the first two years of medicine. This inferiority may result from one or more of several factors. One may be lower admission standards in schools which teach only the first two years of medicine as compared with schools teaching the entire four years. Another factor may be poorer teaching facilities in the two-year schools. Still another factor may be the greater transition a student must make when he transfers from a two-year school to a four-year school; the transition from preclinical to clinical medicine is, in general, more gradual in four-year schools. Regardless of the factors involved, the results indicate the scholastic superiority in clinical medicine of students coming from four-year schools as compared with students from two-year schools.

